Exhibit 5

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17 August 2017

Ms. Theresa Kleinhaus
Attorney
Loevy & Loevy
311 N. Aberdeen St., 3rd floor
Chicago, IL 60607

Subject: Sabein Burgess versus Baltimore Police Department, et al.- Rebuttal Report
Re:McCrone Associates Project MA 61581.A

Dear Ms. Kleinhaus:

ASSIGNMENT

In August 2017, I was contacted by Sarah Grusin of Loevy & Loevy and asked to review a report for this case by Defendants' GSR expert, Micheal A. Knox of Knox & Associates, LLC, issued on July 28, 2017 and provide a rebuttal report. As a portion of his report, Mr. Knox provided discussions concerning statements and opinions that appeared in my report provided to Sarah Grusin on 30 June 2017.

My comments and opinions presented in this report are based on my review of the document submitted to me by Loevy & Loevy and pertinent technical publications. My employer, McCrone Associates, Inc.is being paid $365 an hour for my work in this case.

BACKGROUND

The main issue is the interpretation of gunshot residue (GSR) analysis results as conducted and reported by Daniel Van Gelder, a GSR analyst for the Baltimore Police Department in 1994. In brief, Van Gelder provided the opinion that gunshot residue particles detected on tape lift samplings from the hands of subject Sabein Burgess were likely from firing a gun or having his hands in close proximity to a gun when fired. Furthermore, Van Gelder minimized the possibility of the GSR particles being transferred to Burgess's hands when in contact with the victim and cradling her head on the floor of the basement.

Knox provided commentaries also supporting that opinion and challenged my opinion that the GSR particles on Burgess's hands were most likely from the direct contact with the victim. He claims that there was little or no scientific studies to support my opinion.

Ms. Theresa Kleinhaus
MA 61581.A

REBUTTAL COMMENTS

In general, GSR analysis results revealing the total quantity of GSR particles detected, do not provide probative proof of whether the person fired a gun, was in close proximity to a gun when fired, or was the result of transfer from another object with deposited GSR particles. There are many uncontrolled variables that can account for the presence of any number of GSR particles on a subjects hands. If specific circumstances of a case are known, (the more the better) then refined interpretations could provide more probative value.

In this case Van Gelder and Knox have apparently overlooked a major finding in the gunshot residue analysis results i.e. the extraordinarily high quantity of lead (Pb), and lead antimony (Pb/Sb) particles which are typically attributed to bullet fragments. Bullet fragments form from friction wear while traveling through the barrel of the gun, propelled toward the target, and upon striking the target. An article by Wolten, et.al.[1] published in 1979 presented several tables showing the fraction of bullet fragments compared to the total number of spheroidal particles which were presumed to be primer formed GSR from the test firings. Samples were obtained from the shooters hands after the test firing. The tables show results for three different gun calibers:

Ms. Theresa Kleinhaus
MA 61581.A

TABLE 1—*The .22-caliber*

Test	Spheroidal Particles	
	n	Fraction from Bullet
24	16 800	0.97
25	17 700	0.99
21	3 550	0.93
Mean[d]	9 800	0.96
23	2 426	0.92
71	346	0.88
81	239	0.80
83	110	0.72

TABLE 2—*The .38 Special*

Test	Spheroidal Particles	
	n	Fraction from Bullet
15	7600	0.39
11	3200	0.78
12	2900	0.96
41	6500	0.82
13	100	0.93
16	100	0.45
46	1400	0.73
14	75	0.35
44	200	0.32

TABLE 4—*The .357 Magnum cartridge test results.*[a]

	Test 103	Test 102	Test 101	Test 104
Spheroidal particles				
n	6650	252	383	225
Fraction from bullet	0.95	0.72	0.84	0.89

From Van Gelder's data (handwritten notes from Burgess 003304 – 3338 – BPD GSR report Burgess.pdf, pages 4 and 18. NOTE: It is my understanding that not all of these notes were provided to Mr. Burgess or his attorneys before his trial) and also summarized in Knox's report, page 23, the bullet fraction calculations are:

Burgess right hand- 160 Pb and Pb/Sb particles out of a total of 197 GSR particles for a bullet fraction of 4.3. If calculated as a function of only the total of Pa/Ba/Sb particles (the characteristic GSR particles) the bullet fraction becomes 10.7

Burgess left hand- 36Pb and Pb/Sb particles out of a total of 44 GSR particles for a bullet fraction of 4.5. If calculated as a function of only the total of Pa/Ba/Sb particles (the characteristic GSR particles) the bullet fraction becomes 12.0.

Ms. Theresa Kleinhaus
MA 61581.A

Both numbers are considerably higher than the data in Wolten's article and therefore not consistent with Mr. Burgess having fired a gun or having his hands in close proximity to a gun when fired.

I also looked at some of my own data from a few test firing projects and calculated bullet fractions as a function of total Pa/Ba/Sb particles (the characteristic GSR particles) with these results:

Total Pb/Ba/Sb particles	Fraction of Pb/Sb + Pb particles
240	0.32
185	0.05
402	0.04
87	0.53
154	0.17
603	0.03
256	0.15

This data also shows that bullet fragments are not found in great abundance on a shooters hands.

In addition to the data from Wolten's article, other published articles were available prior to 1993 showing that the vast majority of GSR particles deposited on a target in the line of path of the bullet would be mostly bullet fragments:

- In an article published in 1980 by Ueyama, et.al.[2] it was stated: *"Most GSR collected within 1 foot of the muzzle consists of both bullet lead and primer powder particles; that collected from one to 3 feet consists almost entirely of bullet particles."*
- In an article published in 1992 by Nag and Sinha[3] while referencing an article published in 1987 by Villanueva, et. al., it was stated: *" In their study, Ba and Sb could be detected only up to 80 cm and 200 cm, respectively, which, however, fall within close range (or just exceed it) and the amounts of the elements measured in this range obviously are due to both GSRI and GSRII. This study further indicated that Pb can be preferentially chosen as a detectable item on the target over Ba and Sb, since Pb is found in substantial amount, whose reduction can be studied up to quite a long distance."*

Ms. Theresa Kleinhaus
MA 61581.A

More recently in an article published by Brozek-Mucha[4] in 2009, he presented several bar charts showing the "Chemical class" of particles detected at various distances from a fired gun ranging from 10 cm to 100 cm. The interesting part of the study was that the primer chemicals contained no lead component and yet the Chemical class of particles on the targets consisted of Pb and Pb/Sb from bullet fragments. The Chemical class of antimony (Sb) tin (Sn) was from a major component of the primer that the author speculated had been entrapped on the back side of the bullets.

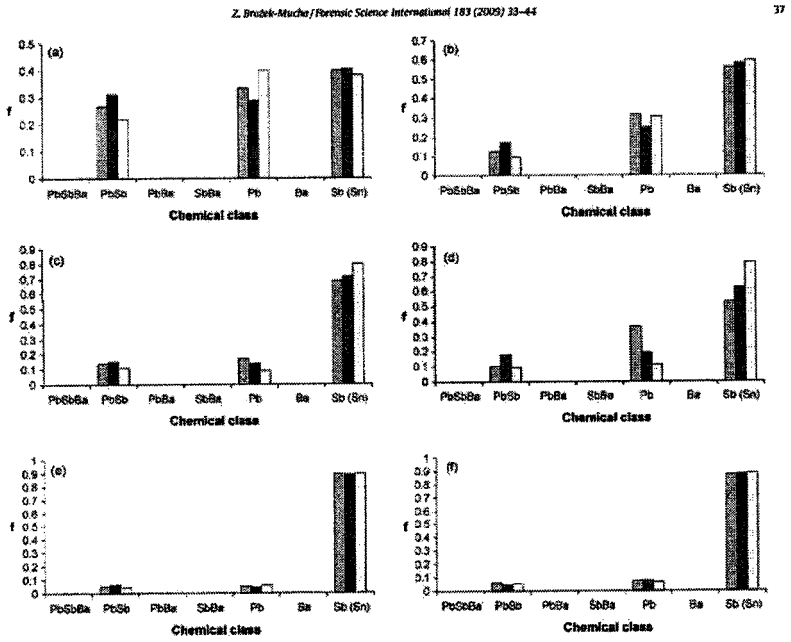

Fig. 2. Frequencies of occurrence f of chemical classes of particles in samples taken from targets in the following shooting distances, s: 10 cm (a), 20 cm (b), 30 cm (c), 50 cm (d), 70 cm (e) and 100 cm (f).

There are few published studies concerning specific details of GSR particle transfer from one object to another as pointed out in Knox's report and I fully agree that is the case. But the fact that there are a few publications indicates that GSR particle transfer is a concern. However, these studies are not relevant to GSR particle transfer in this case. I also agree with Mr. Knox that each case has its own unique circumstances for consideration.

In this particular case the victim was found on the floor of a small area of the basement and had a gunshot wound to her head and chest. The medical examiner determined that the shots were from close range. When officer Weese got to the house and went to the top of the steps to the basement, he stated that he could smell gun smoke and also saw a lingering cloud of smoke. This indicated that GSR particles were still airborne in

the basement and continuing to settle onto various objects in the area. Mr. Burgess stated that he knelt down and cradled the victim around the head.

From the information in the publications cited in this report, one would anticipate a preponderance of bullet fragments (Pb and Pb/Sb) at the target site, in this case, the victim's head and chest. In addition GSR particles would have settled to the floor near the victim and onto the victim from the close range shots. As shown in my original report, I described transfer of GSR particles from a single strand of hair taken from a lock of hair, containing a large, dark smudge. By gently laying the strand of hair onto an adhesive, it was found that huge quantities of GSR particles were transferred to the tape. This provides one scientific reason for my opinion that GSR particles can be transferred easily.

The literature and some of my own data from test firing projects presented in this report clearly shows that the amount of bullet fragments is quite low on the shooters hands compared to the extraordinarily high quantity of bullet fragments detected on the tape lift stubs from Mr. Burgess's hands. Literature also shows that the dominant material found on targets at various distances from a fired gun is bullet fragments. Van Gelder's GSR analysis revealed the extraordinarily high quantity of bullet fragments, which became the major clue to form my opinion that the GSR particles on Mr. Burgess's hands resulted from transfer during contact cradling the victim.

CONCLUSION

Based on the information contained in this report and the extraordinarily high quantity of Pb and Pb/Sb particles compared to primer GSR it is still my opinion that the GSR detected on the tape lifts from Burgess's hands most likely resulted from transfer of the fragments to his hands while he cradled the victim.

REFERENCES

1. Wolton, G.M. et. al. **Particle Analysis for the Detection of Gunshot Residue. I: Scanning Electron Microscopy/Energy Dispersive X-Ray Characterization of Hand Deposits from Firing**, J Forensic Sci, Apr. 1979, Vol. 24, No. 2. pp.409-422.

2. M. Ueyama*, R.L. Taylor, T.T. Noguchi, **SEM/EDS Analysis of Muzzle Deposits at Different Target Distances**, Scanning Electron Microscopy/1980/1 SEM Inc., AMF O'Hare(Chicago) , IL 60666, USA pp.367-374.

Ms. Theresa Kleinhaus
MA 61581.A

3. K. NAG and P. SINHA, **A Note on Assessability of Firing Distance from Gunshot Residues,** *Forensic Science International,* 56 (1992) 1-17.

4. Zuzanna Brozek-Mucha, **Distribution and Properties of Gunshot Residue Originating from a Luger 9 Mm Ammunition in the Vicinity of the Shooting Gun,** Forensic Science International 183 (2009) 33-44

Thank you for consulting McCrone Associates. If you have any questions about this report, please feel free to contact me by telephone or by e-mail at wniemeyer@mccrone.com.

Sincerely,

Wayne D. Niemeyer

Wayne D. Niemeyer
Senior Research Scientist

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